

a drive mechanism for moving at least one of the high frequency coil antenna and the reaction tube relative to the other when performing plasma etching.

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3. (ONCE AMENDED) The plasma etching apparatus according to claim 2, wherein the high frequency coil antenna includes a plurality of winding portions and a sloped segment for connecting the plurality of winding portions to one another in series.

A2  
7. (ONCE AMENDED) The plasma etching apparatus according to claim 2, wherein the portion that produces a relatively large capacitive coupling with the reaction tube is located closer to the reaction tube than the remaining portion of the high frequency coil antenna.

10. (ONCE AMENDED) The plasma etching apparatus according to claim 2, further comprising a controller connected to the drive mechanism for controlling a relative moving speed between the high frequency coil antenna and the reaction tube.

A3  
9-17  
11. (ONCE AMENDED) A plasma processing apparatus comprising:  
a processing chamber for performing predetermined process on a workpiece;  
a reaction tube connected to the processing chamber, the reaction tube being made of a dielectric material in the form of a cylinder;  
a high frequency coil antenna located around the reaction tube for generating a plasma inside the reaction tube, the high frequency antenna having a portion that produces a relatively large capacitive coupling with the reaction tube, a power supply terminal connected to a plasma source high frequency power supply, and a ground terminal connected to a ground; and  
a drive mechanism for moving at least one of the high frequency coil antenna and the reaction tube relative to the other when performing the process on the workpiece.

A4  
13. (ONCE AMENDED) A plasma etching apparatus comprising:  
an etching chamber for accommodating a workpiece;  
a reaction tube connected to the etching chamber, the reaction tube being made of a dielectric material in the form of a cylinder;  
a coil antenna surrounding an outer wall of the reaction tube, the coil antenna including a

first winding, a second winding, and an intermediate segment connecting the first winding to the second winding;

a plasma generating power supply for supplying high frequency power to the coil antenna; and

a drive mechanism for moving at least one of the coil antenna and the reaction tube relative to the other when performing plasma etching on the workpiece, wherein the intermediate segment is located closer to an outer peripheral surface of the reaction tube than the first winding and the second winding.

17. (ONCE AMENDED) The plasma etching apparatus according to claim 13, further comprising a controller connected to the drive mechanism for controlling a relative moving speed between the coil antenna and the reaction tube.

18. (ONCE AMENDED) The plasma etching apparatus according to claim 13, wherein the drive mechanism rotates the coil antenna around the reaction tube.

21. (NEW) The plasma etching apparatus according to claim 3, wherein the sloped segment is wound around approximately one fourth of a circumference of a peripheral surface of the reaction tube.

22. (NEW) The plasma etching apparatus according to claim 21, wherein each winding is wound around approximately three-fourths of the circumference of the peripheral surface of the reaction tube.

23. (NEW) A plasma etching apparatus comprising:  
a reaction tube made of a dielectric material in a form of a cylinder; and  
a high frequency coil antenna, located around the reaction tube, to generate a plasma inside the reaction tube, the high frequency coil antenna having a portion that produces a relatively large capacitive coupling with the reaction tube, a power supply terminal connected to a plasma source high frequency power supply, and a ground terminal connected to a ground.